

COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Northern Virginia Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS

City of Manassas/Virginia Municipal Electric Association
9898 Godwin Drive, Virginia 20110
Permit No. NVRO71977

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, The City of Manassas/VMEA has applied for a Title V Operating Permit for its peaking power generation plant, located at 9898 Godwin Drive, Manassas, Virginia (Godwin Plant). The Department has reviewed the application and has prepared a draft Title V Operating Permit.

Engineer/Permit Contact:_____

Date:_____

Air Permit Manager:_____

Date:_____

Regional Permit Manager:_____

Date:_____

FACILITY INFORMATION

Permittee

City of Manassas/VMEA
8500 Public Works Drive
P.O. Box 560
Manassas, Virginia 20110

Facility

City of Manassas/VMEA - Godwin Plant
9898 Godwin Drive
Manassas, Virginia 20110

AIRS ID No. 51-153-00090

SOURCE DESCRIPTION

SIC Code: 4911 - Electric Services – Establishments engaged in the generation, transmission and/or distribution of electric energy for sale.

The City of Manassas/Virginia Municipal Electric Association (VMEA) operates the peaking electric power generation plant in Manassas with 16 Caterpillar 3516 diesel-fired electric generators, each rated at 1600 kilowatts (KW) output. The City of Manassas operates 12 of the generators as a member of the VMEA under contract with Virginia Power to produce electricity when notified during peak electric demand periods. The other four engines belong to the City of Manassas, which operates them for further savings during peak demand periods. The facility was previously permitted under a minor NSR permit issued on September 19, 1995. The permit requires 3 degrees fuel injection timing retard set for each engine and limits the facility to generating no more than 6,944,000 electric kilowatt-hours (KW-hrs) per year or about 280 hours per engine. The facility is a Title V major source for nitrogen oxides (as NO₂) in a region designated as a serious ozone nonattainment area, for which NO₂ and volatile organic compounds (VOC) are precursor pollutants. The area is in attainment for all other criteria pollutants.

COMPLIANCE STATUS

The facility is inspected at least once a year. The facility was last inspected on 5/30/01 and was determined to be in compliance with the state and federal air regulations.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units at this facility consist of the following :

| Emission Unit ID | Stack ID | Emission Unit Description | Size/Rated Capacity* | Pollution Control Device (PCD) Description | PCD ID | Pollutant Controlled | Applicable Permit Date |
|--------------------------------------|----------|------------------------------|----------------------|--|--------|----------------------|------------------------|
| Fuel Burning Equipment | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Process A (Diesel Generators) | | | | | | | |
| V1-V12 | S1-S12 | Caterpillar 3516 DITA diesel | 1600 KW/2307 bhp | Ignition Timing retard | - | NO ₂ | 09/19/95 |
| C7-C10 | S13-S16 | Caterpillar 3516 DITA diesel | 1600 KW/2307 bhp | Ignition Timing retard | - | NO ₂ | 09/19/95 |
| Process B (Storage Tanks) | | | | | | | |
| FO1-FO4 | - | Fuel Oil Storage Tanks | 15,000 gal., each | - | - | - | - |
| | | | | | | | |

The Size/Rated capacity [and PCD efficiency] is provided for informational purposes only, and is not an applicable requirement.

EMISSIONS INVENTORY

A copy of the 2000 annual emission update and statement is attached as Attachment A. Emissions are summarized in the following tables.

2000 Actual Emissions

| | 2000 Criteria Pollutant Emission in Tons/Year | | | | |
|----------------|---|-------|-----------------|------------------|-----------------|
| Emission Units | VOC | CO | SO ₂ | PM ₁₀ | NO _x |
| V3-V10 | 1.68 | 12.50 | 9.62 | 1.28 | 54.82 |
| V1-V2, C7-C10 | 0.59 | 4.36 | 3.35 | 0.45 | 19.12 |
| V11-V12 | 0.20 | 1.47 | 1.13 | 0.15 | 6.43 |
| | | | | | |
| Total | 2.47 | 18.33 | 14.1 | 1.88 | 80.37 |

2000 Facility Hazardous Air Pollutant Emissions

| Pollutant | Hazardous Air Pollutant Emission in Tons/Year |
|---------------|---|
| None reported | |
| | |

EMISSION UNIT APPLICABLE REQUIREMENTS - [emission unit or units]

Process Equipment Requirements – Units #V1-V12, #C7-C10

Most of the conditions for the generator plant have been taken from the new source permit issued on September 19, 1995, as amended on October 20, 1995. Conditions that no longer apply have been excluded and also there are some minor wording changes. In addition, the regulatory references have been updated, reflecting the new regulation numbering system. A copy of the original permit is enclosed as Attachment B.

Limitations

Condition 1 requires control of nitrogen oxides (as NO₂) by setting the engine fuel injection to 3 degrees retarded timing.

Conditions 2 and 3 limit the type of fuel to diesel with maximum 0.5% sulfur content.

Condition 4 limits the generation of electricity from the plant to 6,944,000 electric kilowatt-hours per year. The wording “(16 engines, each operated at 1550 KW, 280 hours)” found in the 9/19/95 permit condition 6 was removed, since it was only given to clarify the basis of the limit and not intended to be used for compliance purposes.

Conditions 5 and 6 specify the emission limits for the generators.

Condition 7 is a general requirement for the generators to be operated by trained personnel familiar with the equipment and manufacturer operating instructions.

Condition 8 requires that a maintenance schedule be developed and followed for the generators, with records kept on all scheduled and any non-scheduled maintenance.

Monitoring and Recordkeeping

The permit includes requirements to maintain records of maintenance, monitoring and testing. Records of engine maintenance, Condition 1, and operator training, Condition 4, will be used to demonstrate proper operations which minimizes emissions. The records include all maintenance and repairs made to the engines and certification of their fuel injection setting for 3 degrees retarded timing. No direct emissions monitoring are required. Instead, Condition 2 requires weekly visible emissions observation to be made as an indicator of proper engine operation and for periodic monitoring purposes. In case of excess emission problems, but also at least once a year during September, EPA

Method 9 visible emission evaluations will be conducted for each engine, as stated in Testing Condition III.C.3, to demonstrate compliance with the opacity limit. Furthermore, Condition 3 states that monthly records be kept on the kilowatt-hours of electricity generated, which is used to calculate the annual total for comparison with the permit limit. The records shall be kept current for most recent 5-year period.

Actual emissions from the operation of the generators will be calculated for the emissions inventory using the annual kilowatt-hours of electricity produced by the diesel generators. The permit emission factors are calculated from AP-42 data and engine kilowatts, except for nitrogen oxides (as NO₂) which is controlled by the fuel injection timing retard. The NO₂ factor was based on the results of stack testing conducted on March 14, 1994 where the highest value was used to calculate the factor (53 lbs/hour ÷ 1550 KW = 0.0342 lbs/KW-hr). The following table shows the AP-42 factors in units of grams/horsepower-hour and the calculated permit factors in units of lbs/electric KW-hr:

| Pollutant | AP-42 Emission Factor (grams/horsepower-hour) | Permit Emission Factor (lbs/kilowatt-hour) |
|-------------------------------------|--|---|
| Nitrogen Dioxide (NO ₂) | 11.0 (not used in permit) | 0.0342 (based on stack test) |
| Sulfur Dioxide (SO ₂) | 1.835 (based on 0.5% sulfur) | 0.00602 |
| Carbon Monoxide (CO) | 2.4 | 0.00788 |
| Volatile Organic Compounds | 0.33 | 0.00105 |
| Particulate Matter (PM-10) | 0.2426 | 0.0008 |
| Total Suspended Particulates | 0.2426 (assume = PM-10) | 0.0008 |

Actual emissions are calculated by multiplying the appropriate emission factor and the generated kilowatt-hours of electricity, with annual data calculated as the sum of each consecutive 12-month period. Therefore, the following are calculated annual emissions for the incinerator plant using maximum 6,944,000 kilowatt-hours of electricity per year:

$$\begin{aligned}\text{NO}_2 &= (6,944,000 \text{ KW-hrs}) \times (0.0342 \text{ lbs/KW-hr}) \div 2000 \text{ lbs/ton} = 118.72 \text{ tons/yr} \\ \text{SO}_2 &= (6,944,000 \text{ KW-hrs}) \times (0.00602 \text{ lbs/KW-hr}) \div 2000 \text{ lbs/ton} = 20.90 \text{ tons/yr} \\ \text{CO} &= (6,944,000 \text{ KW-hrs}) \times (0.00788 \text{ lbs/KW-hr}) \div 2000 \text{ lbs/ton} = 27.35 \text{ tons/yr} \\ \text{VOC} &= (6,944,000 \text{ KW-hrs}) \times (0.00105 \text{ lbs/KW-hr}) \div 2000 \text{ lbs/ton} = 3.65 \text{ tons/yr} \\ \text{PM-10} &= (6,944,000 \text{ KW-hrs}) \times (0.0008 \text{ lbs/KW-hr}) \div 2000 \text{ lbs/ton} = 2.78 \text{ tons/yr}\end{aligned}$$

An initial compliance test was performed on two generators with 3 degrees fuel injection

timing retard. The NO₂ emission test results demonstrated compliance with the calculated limits and was used as basis for the revised emissions limit, as stated in their latest permit of September 19, 1995. Proper operation and maintenance of the generators should ensure continuous compliance with the nitrogen oxides limit. EPA Compilation of Air Pollutant Factors (AP-42) is used for the other criteria pollutants.

The opacity limit of 20% must not be exceeded by any source in the state, including diesel generators. Fuel injection timing retard reduces nitrogen oxides emissions but increases other criteria pollutant emission rates, including visible emissions. The purpose of choosing 3 degrees retard was to achieve the most NO₂ reduction while not exceeding the state opacity standard. Initial visible emissions testing was successfully conducted, in accordance with the new source permit. Using diesel (No. 2) fuel oil may produce more emissions during startup, shutdown or malfunction, but the Virginia air regulations exempts those periods from consideration. Visible emissions will also be used as an indicator of generator problems. Periodic monitoring is achieved by observing the exhaust stack for excess visible emissions during each week that the engines operate, and by following regular inspection and maintenance procedures. To demonstrate continuing compliance for the Title V permit, additional visible emission evaluation is being required annually for each engine during the month of September.

Facility inspection reports by DEQ compliance staff have revealed no violations of the limitations contained in the permit. The permittee shall continue to follow manufacturer recommendations for proper operation and maintenance of the generators and provide for operator training to minimize malfunctions and excess emissions. Records kept on calculated emissions using DEQ-approved factors and equations, visible emissions, equipment maintenance, repair and calibration, and also operator training will be used for demonstrating compliance with the emissions limitations also. Proper recordkeeping is used to satisfy the periodic monitoring requirements.

Testing

Initial compliance stack testing on the generators for nitrogen oxides (as NO₂) and visible emissions evaluations were required and successfully completed on March 14, 1994. Only two units were tested at 3 degrees of fuel injection timing retard since the Department also required testing at 0 and 1.5 degrees of retard for purposes of comparing emissions. Two other generators were tested on November 30, 1993 at 5 degrees of retard with resulting lower nitrogen oxides emissions but excessive visible emissions exceeding the state standards. Setting the fuel injection for 3 degrees retarded timing provided reductions in NO₂ emissions without exceeding the 20% opacity limit. At the present time, additional NO₂ testing is not required. Proper operation and maintenance shall minimize emissions,

but periodic monitoring Condition III.B.2 also requires weekly observation of the exhaust stack as an indicator of engine problems. Then, regular visible emissions evaluation, in accordance with EPA Reference Method 9, shall be conducted for each engine to demonstrate compliance with the opacity limit. The evaluation shall be conducted at least once a year in September, and whenever an exceedance is found that requires non-routine engine repair and adjustment.

Although the permit does not require further stack testing, except for visible emission evaluation, a table of test methods has been included in case later testing is performed. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

No specific reporting requirement has been included in the permit other than that required by general conditions. However, reports shall be submitted upon request of the Department, such as the annual emission inventory update and certified emission statements.

Streamlined Requirements

There were no streamlined requirements for the generators. However, conditions from the new source permit, which are no longer applicable (such as initial stack testing or reporting requirements), are not included. For reference, a copy of the original permit is enclosed as Attachment B.

Process Equipment Requirements – Units #FO1-FO4

Limitations

Only the 15,000-gallon capacity storage tanks are subject to NSPS Subpart Kb. The tanks are used only for diesel, No.2 or distillate fuel oil storage.

Recordkeeping

For the tanks with capacity of 40 to 75 cubic meters (or 10,569 to 19,817 gallons), the NSPS Subpart Kb only requires records be kept on their dimensions and capacity.

FACILITY-WIDE CONDITIONS

No separate facility-wide conditions are given, since the specific conditions are already

stated in the Process Equipment Requirements section of the permit. The general facility-wide conditions are given in the General Conditions section of the permit.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

| Emission Unit No. | Emission Unit Description | Citation | Pollutant(s) Emitted (9 VAC 5-80-720 B) | Rated Capacity (9 VAC 5-80-720 C) |
|-------------------|---------------------------|-----------------|---|-----------------------------------|
| DT1-DT8 | Day Tanks | 9 VAC 5-80-720B | VOC | 1,000 gallons, each |

These emission units are presumed to be in compliance with all requirements of the federal Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping, or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

9 VAC 5-80-720 A -Listed Insignificant Activity, Not Included in Permit Application
9 VAC 5-80-720 B - Insignificant due to emission levels
9 VAC 5-80-720 C - Insignificant due to size or production rate

INAPPLICABLE REQUIREMENTS

The Department has not established any inapplicable requirements to list in the permit. Consideration was given to mentioning the following standard for fuel oil storage tanks:

New Source Performance Standards (NSPS), 40 CFR Part 60, Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced After July 23, 1984.

However, the small diesel fuel day tanks (#DT1-DT8), each with a capacity of 1000 gallons, are exempt from the provisions of the subpart. For the 15,000 gallon storage tanks (#FO1-FO4), only minor recordkeeping provisions of the subpart apply, which is already stated in IV. A., B.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal-operating permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report.

The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upsets, within one business day.

Comments on General Conditions

B: Permit Expiration

This condition refers to the Board taking action on a permit application. The Board referred to is the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by ' 2.1-20.01:2 and ' 10.1-1185 of the *Code of Virginia*, and the "Department of Environmental Quality Agency Policy Statement NO. 3-2001".

This general conditions cites the entire Article(s) that follow:

B.2. Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Permits for Stationary Sources

B.3. Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Permits for Stationary Sources

This general condition cites the sections that follow:

- B. 9 VAC 5-80-80. "Application"
- B.2. 9 VAC 5-80-150. "Action on Permit Applications"
- B.3. 9 VAC 5-80-80. "Application"
- B.4. 9 VAC 5-80-80. "Application"
- B.4. 9 VAC 5-80-140. "Permit shield"
- B.5. 9 VAC 5-80-80. "Application"

STATE ONLY APPLICABLE REQUIREMENTS

All conditions of the permit are considered federally enforceable and based on state regulations as approved by federal EPA. No State-only requirements are applicable.

CONFIDENTIAL INFORMATION

The City of Manassas/VMEA did not submit a request for confidentiality. Therefore, all portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

A public notice regarding the draft permit was placed in The Washington Times on August 13, 2001. EPA was sent a copy of the draft permit and notified of the public notice on August 9, 2001, which was confirmed to have been received on August 13, 2001. The draft permit was submitted to EPA also for concurrent review as a proposed permit. The affected States of Maryland and West Virginia were sent a copy of the public notice on August 9, 2001. In addition, the City of Washington, D.C. as well as the City of Alexandria and Fairfax County were sent a copy of the public notice on August 9, 2001. All persons on the Title V mailing list were also sent a copy of the public notice in letters dated August 9, 2001.

Public comments were accepted from August 13, 2001 to September 12, 2001. The only comments received were from EPA by E-mail dated September 14, 2001. They suggested including a footnote to permit Condition III.A.5 that annual emissions be calculated monthly as the sum of each consecutive 12-month period. Also, an item was added to Condition III.B.3 stating that DEQ-approved emission factors and equations be used to calculate generator emissions. Finally, Condition III.C.3 was changed, at request of the applicant, for visible emission evaluations to be conducted each year during September. The minor changes were incorporated in the proposed permit.